

## Welcome to DialogClassic Web(tm)

Dialog level 03.02.02D  
Last logoff: 18oct03 00:06:55  
Logon file405 19oct03 15:18:49

### \*\*\* ANNOUNCEMENT \*\*\*

--File 654 - US published applications from March 15, 2001 to the present are now online. Please see HELP NEWS 654 for details.

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--File 581 - The 2003 annual reload of Population Demographics is complete. Please see Help News581 for details.

\*\*\*

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--File 990 - NewsRoom now contains February 2003 to current records.  
File 992 - NewsRoom 2003 archive has been newly created and contains records from January 2003. The oldest months's records roll out of File 990 and into File 992 on the first weekend of each month.  
To search all 2003 records BEGIN 990, 992, or B NEWS2003, a new OneSearch category.

\*\*\*

--Connect Time joins DialUnits as pricing options on Dialog.  
See HELP CONNECT for information.

\*\*\*

\*\*\* --SourceOne patents are now delivered to your email inbox as PDF replacing TIFF delivery. See HELP SOURCE1 for more information.

\*\*\*

--Important news for public and academic libraries. See HELP LIBRARY for more information.

\*\*\*

--Important Notice to Freelance Authors--  
See HELP FREELANCE for more information

\*\*\*

### NEW FILES RELEASED

\*\*\*World News Connection (File 985)  
\*\*\*Dialog NewsRoom - 2003 Archive (File 992)  
\*\*\*TRADEMARKSCAN-Czech Republic (File 680)  
\*\*\*TRADEMARKSCAN-Hungary (File 681)  
\*\*\*TRADEMARKSCAN-Poland (File 682)

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### UPDATING RESUMED

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### RELOADED

\*\*\*Population Demographics -(File 581)  
\*\*\*CLAIMS Citation (Files 220-222)

### REMOVED

\*\*\*

\*\*\* DIALOG HOMEBASE(SM) Main Menu \*\*\*

### Information:

1. Announcements (new files, reloads, etc.)
2. Database, Rates, & Command Descriptions
3. Help in Choosing Databases for Your Topic
4. Customer Services (telephone assistance, training, seminars, etc.)
5. Product Descriptions

### Connections:

6. DIALOG(R) Document Delivery
7. Data Star(R)

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/H = Help

/L = Logoff

/NOMENU = Command Mode

Enter an option number to view information or to connect to an online service. Enter a BEGIN command plus a file number to search a database (e.g., B1 for ERIC).

?

B IGOR705

>>> 77 does not exist

>>>1 of the specified files is not available

19oct03 15:19:09 User268082 Session D46.1

\$0.00 0.225 DialUnits FileHomeBase

\$0.00 Estimated cost FileHomeBase

\$0.07 INTERNET

\$0.07 Estimated cost this search

\$0.07 Estimated total session cost 0.225 DialUnits

SYSTEM:OS - DIALOG OneSearch

File 2:INSPEC 1969-2003/Oct W2

(c) 2003 Institution of Electrical Engineers

**\*File 2: Alert feature enhanced for multiple files, duplicates removal, customized scheduling. See HELP ALERT.**

File 9:Business & Industry(R) Jul/1994-2003/Oct 17

(c) 2003 Resp. DB Svcs.

File 15:ABI/Inform(R) 1971-2003/Oct 18

(c) 2003 ProQuest Info&Learning

**\*File 15: Alert feature enhanced for multiple files, duplicate removal, customized scheduling. See HELP ALERT.**

File 16:Gale Group PROMT(R) 1990-2003/Oct 17

(c) 2003 The Gale Group

**\*File 16: Alert feature enhanced for multiple files, duplicate removal, customized scheduling. See HELP ALERT.**

File 20:Dialog Global Reporter 1997-2003/Oct 19

(c) 2003 The Dialog Corp.

File 35:Dissertation Abs Online 1861-2003/Sep

(c) 2003 ProQuest Info&Learning

File 65:Inside Conferences 1993-2003/Oct W2

(c) 2003 BLDSC all rts. reserv.

File 99:Wilson Appl. Sci & Tech Abs 1983-2003/Sep

(c) 2003 The HW Wilson Co.

File 148:Gale Group Trade & Industry DB 1976-2003/Oct 20

(c)2003 The Gale Group

**\*File 148: Alert feature enhanced for multiple files, duplicate removal, customized scheduling. See HELP ALERT.**

File 160:Gale Group PROMT(R) 1972-1989

(c) 1999 The Gale Group

File 233:Internet & Personal Comp. Abs. 1981-2003/Jul

(c) 2003, EBSCO Pub.

File 256:SoftBase:Reviews,Companies&Prods. 82-2003/Sep

(c)2003 Info.Sources Inc

File 275:Gale Group Computer DB(TM) 1983-2003/Oct 17

(c) 2003 The Gale Group

File 347:JAPIO Oct 1976-2003/Jun(Updated 031006)

(c) 2003 JPO & JAPIO

**\*File 347: JAPIO data problems with year 2000 records are now fixed.**  
Alerts have been run. See HELP NEWS 347 for details.

File 348:EUROPEAN PATENTS 1978-2003/Oct W02  
(c) 2003 European Patent Office  
File 349:PCT FULLTEXT 1979-2002/UB=20031016,UT=20031009  
(c) 2003 WIPO/Univentio  
File 474:New York Times Abs 1969-2003/Oct 17  
(c) 2003 The New York Times  
File 475:Wall Street Journal Abs 1973-2003/Oct 17  
(c) 2003 The New York Times  
File 476:Financial Times Fulltext 1982-2003/Oct 18  
(c) 2003 Financial Times Ltd  
File 583:Gale Group Globalbase(TM) 1986-2002/Dec 13  
(c) 2002 The Gale Group

**\*File 583: This file is no longer updating as of 12-13-2002.**

File 610:Business Wire 1999-2003/Oct 19  
(c) 2003 Business Wire.

**\*File 610: File 610 now contains data from 3/99 forward.**

Archive data (1986-2/99) is available in File 810.

File 613:PR Newswire 1999-2003/Oct 19  
(c) 2003 PR Newswire Association Inc

**\*File 613: File 613 now contains data from 5/99 forward.**

Archive data (1987-4/99) is available in File 813.

File 621:Gale Group New Prod.Annou.(R) 1985-2003/Oct 20  
(c) 2003 The Gale Group

File 624:McGraw-Hill Publications 1985-2003/Oct 17  
(c) 2003 McGraw-Hill Co. Inc

**\*File 624: Homeland Security & Defense and 9 Platt energy journals added**

Please see HELP NEWS624 for more

File 634:San Jose Mercury Jun 1985-2003/Oct 17  
(c) 2003 San Jose Mercury News

File 636:Gale Group Newsletter DB(TM) 1987-2003/Oct 17  
(c) 2003 The Gale Group

File 810:Business Wire 1986-1999/Feb 28  
(c) 1999 Business Wire

File 813:PR Newswire 1987-1999/Apr 30  
(c) 1999 PR Newswire Association Inc

Set Items Description

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?

S MERGERS (20N) ACQUISITIONS (20N) (MARKET (2N) POWER) (20N) (ELECTRIC (2N) POWER (2  
>>>Unmatched parentheses

?

S MERGERS (20N) ACQUISITIONS (20N) (MARKET (2N) POWER) (20N) (ELECTRIC (2N) POWER (2  
Processed 10 of 28 files ...

Processing

Completed processing all files

3973682 MERGERS  
4853705 ACQUISITIONS  
19024561 MARKET  
7976101 POWER  
4011777 ELECTRIC  
7976101 POWER  
19473529 INDUSTRY  
875715 JOSEPH  
422679 DIAMOND

S1 0 MERGERS (20N) ACQUISITIONS (20N) (MARKET (2N) POWER)

(20N) (ELECTRIC (2N) POWER (2N) INDUSTRY) (20N) (JOSEPH  
(3N) DIAMOND)

?

S CONTRACT??? (20N) (POWER (2N) TRANSFER)

Processing

Processed 10 of 28 files ...

Processing

Processed 20 of 28 files ...

Completed processing all files

8013382 CONTRACT???

7976101 POWER

2962309 TRANSFER

S2 502 CONTRACT??? (20N) (POWER (2N) TRANSFER)

?

S S2 AND (FLOW (2N) GATE?)

>>>Unmatched parentheses

?

S S2 AND (FLOW (2N) GATE?)

Processed 20 of 28 files ...

Processing

Completed processing all files

502 S2

3224974 FLOW

1707784 GATE?

3299 FLOW(2N)GATE?

S3 8 S2 AND (FLOW (2N) GATE?)

?

T S3/KWIC/1-8

**3/KWIC/1 (Item 1 from file: 349)**

DIALOG(R)File 349:(c) 2003 WIPO/Univentio. All rts. reserv.

Fulltext Availability:

Detailed Description

Detailed Description

... of transmitting electrical power, particularly AC electrical power  
has significant congestion paths, known herein as **flow gates** .

There has been little economic incentive to increase the transmission  
capacity through the **flow gates** , in part because there is no coherent  
policy provided fair and predictable economic return to...market to trade  
transfer capability between

70

users. Because of the linear nature of AC **power transfer** throughout  
an AC **power** network, these **transfer** rights can be linearly  
accumulated to insure the **contracted** transfers are physically feasible  
in satisfying the overall flowgate constraints of the AC power network.

**3/KWIC/2 (Item 2 from file: 349)**

DIALOG(R)File 349:(c) 2003 WIPO/Univentio. All rts. reserv.

Fulltext Availability:

## Detailed Description

### Detailed Description

... of transmitting electrical power, particularly AC electrical power has significant congestion paths, known herein as **flow gates**. There has been little economic incentive to increase the transmission capacity through the **flow gates**, in part because there is no coherent policy provided fair- and predictable economic return to...a market to trade transfer capability between users.

Because of the linear nature of AC **power transfer** throughout an AC **power** network, these **transfer** rights can generally be linearly accumulated to insure the **contracted** transfers are physically feasible in satisfying the overall flowgate constraints of the AC power network...

### 3/KWIC/3 (Item 3 from file: 349)

DIALOG(R) File 349: (c) 2003 WIPO/Univentio. All rts. reserv.

### Fulltext Availability:

#### Detailed Description

### Detailed Description

... power so that wind power-based units of electrical power may be available for forward **contracts** as part of a "renewable exchange" that enables the **transfer** of wind **power** units (i.e., a predetermined amount of power), perhaps coupled or guaranteed power ...the hydroelectric plant 51 1 so that 0 the processor contained therein can adjust the **flow gates** in the hydroelectric plant. This control is done in real time so that the an...

### 3/KWIC/4 (Item 4 from file: 349)

DIALOG(R) File 349: (c) 2003 WIPO/Univentio. All rts. reserv.

### Fulltext Availability:

#### Detailed Description

### Detailed Description

... power so that wind power-based units of electrical power may be available for forward **contracts** as part of a "renewable exchange" that enables the **transfer** of wind **power** units (i.e., a 2 5 predetermined amount of power), perhaps coupled or guaranteed power...the hydroelectric plant 5 1 1 so that the processor contained therein can adjust the **flow gates** in the hydroelectric plant. This 3 0 control is done in real time so that...

### 3/KWIC/5 (Item 5 from file: 349)

DIALOG(R) File 349: (c) 2003 WIPO/Univentio. All rts. reserv.

### Fulltext Availability:

#### Detailed Description

### Detailed Description

... different transformers may have differing transformer capacity limits. These constrained flow lo elements are called **flow gates**. In the last few years the importance of **flow**

**gates** has begun to emerge through the actions of NERC, which has been responsible for building a model estimating **flow gate** impact, which can be downloaded from their web site.

A **flow gate** of a given AC power network will refer herein to a collection of at least...

...of that network.

All lines have maximum safe carrying capacities and thus could be considered **flow gates**, of a sort. However, historical congestion analysis of specific AC power networks reveals that only a small number of **flow gates** account for almost all congestion problems. Such **flow gates** will be herein referred to as significant **flow gates**.

The associated AC power transfer across a given **flow gate** is additive due to the super positioning effects previously discussed. Thus in sending 1 00 megawatts along a path, the transmission may have a 1 0% impact on the **flow**

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**gate**, putting 10 megawatts on the **flow gate**. A second generator may have a 5% impact on that **flow gate**. Generating 100 megawatt at the second generator would add 5 megawatt across the **flow gate**.

Figure 1 depicts an exemplary AC power network based upon contemporary AC power technology as...

...1 0. Line 11 2 runs between node I 1 0 and node 120.

2o **Flow gate** A 210 is a constraint on the network. Lines 32, 34 and 42 are constrained by **flow gate** A 210 by a total maximum safe carrying capacity, in that these lines have transmission capacity limitations which are easily overloaded when this maximum safe carrying capacity is exceeded.

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**Flow gate** B 220 is a constraint on the network. Lines 42 and 44 are constrained by **flow gate** B 220. These lines are also constrained by a total maximum safe carrying capacity due...

...as their proximity at some critical junction of the system, such as a mountain pass.

**Flow gate** C 230 is a constraint on the network. Lines 52 and 62 are constrained by **flow gate** C 230 to a total maximum safe carrying capacity.

Figure 2 depicts a list of associated AC power functions for each **flow gate** of a collection of **flow gates** for each of the busses of the various nodes of the exemplary AC power network...

...values in the first row of Figure 2 indicate the ratio of power transferred across **flow gates** A, B, and C. If the power is generated at Bus 1 1 and consumed...

...an essentially linear effect on all transmission lines in the network, and consequently impact all **flow gates** within that network to some extent.

This contract path system of scheduling power transmission reserves...

...making up the direct path. It often occurs that some constraint, occurring across a significant **flow gate** off that direct path, actually limits the transmission capability on the direct path.

The contract...to purchase separately transmission from A to C. this is because there might be some **flow gate** constraint which would not be met in the two separate paths which would be triggered...

...path becomes over-constrained, cuts are issued to compensate. The central operator acts, because a **flow gate** will attempt to exceed its safe carrying capacity, forbidding transmission often across apparently irrelevant paths...

...commitment decisions. Nor can price risks be easily hedged.

NERC has developed a methodology addressing **flow gates** to some extent.

2o This is discussed in a document entitled "Discussion Paper on Aligning ...

...shift to a system of reserving and scheduling transmission based on actual use of congested **flow gates**, which they called the 13 FLOWBAT method. Their proposal suffers from a serious omission, it does not address the issue of allocating **flow gate** capacity when demand exceeds supply. By their silence on this issue, it appears that they...

...case called Transaction Participation Functions (TPFs).

These distribution functions refer to transmission paths rather than **flow gates**. GAPP attempts to align compensation paid by transmission users with actual power flows. However, GAPP...the physics of AC power networks. Further, since transmission rights are predominantly constrained by significant **flow gates**, what is needed should account for the effect on the significant **flow gates** for each contracted transmission. A method and mechanism is needed for trading generation and transmission...the prior art; Figure 2 depicts a list of associated AC power functions for each **flow gate** of a collection of **flow gates** for each of the busses of the various nodes of the exemplary AC power network...computer showing an ordering screen for hourly time interval based market intervals for a specific **flow gate** market in accordance with certain embodiments of the invention; Figure 25 depicts a flowchart...are not limited to acoustic interfaces to humans, audio and visual identification portals to the contracting of AC power transfer regarding **flow gates**, encoding and decoding

mechanisms used in long distance communication and interfaces to recording to devices of agreed **contracts** .  
A program step as used herein refers to instructions in a form executable or inferentially...

...product type 1 1 1 0 of the market interval is described as an Energy product type 1110. The location 1112 is a flow gate of the **flow gate** collection of a first AC power network contained in the 20 electrical power grid. Note that **flow gates** can represent a congestion constraint across more than one transmission line, and may not have a specific first node to second node description.

Such embodiments of the invention of a **flow gate** market interval are advantageous in providing a market to trade transfer capability between  
39

users. Because of the linear nature of AC **power transfer** throughout an AC **power** network, these **transfer** rights can be linearly accumulated to insure the **contracted** transfers are physically feasible in satisfying the overall flowgate constraints of the AC power network... networks indicates each AC power network contained in the electrical power grid further contains a **flow gate** collection of **flow gates** . Each **flow gate** location being either from an associated first node of the AC power network to an...

...in the case of a collection of constrained transmission lines, will be denoted by a **flow gate** designator. An AC power transfer amount from node1 to node2 produces an amount of AC power transfer across the **flow gate** as essentially an associated linear, skewsymmetric function of the amount from node1 to node2, for each of the **flow gates** of the **flow gate** collection. For each of the **flow gates** of the **flow gate** collection, there is at least one market interval in the market interval collection of AC power transfer product type with the **flow gate** location.

Each validated order of the validated order collection with the AC power transfer product...

...node to the second node may be further comprised of a validated order of the **flow gate** associated market interval. The amount ordered for that **flow gate** is essentially the associated linear, skew-symmetric function of the amount from the first node to the second node, for each of the **flow gates** of the **flow gate** collection.

Note that there may be a price associated with each validated order of the AC power transfers of the **flow gates** . There may be a price associated with the AC power transfer from the first node...of an AC power network. Assume that AC power network has a collection of three **flow gates** . A validated order for an AC power transfer amount from node1 to node2 may contain validated orders for an associated amount for each **flow gate** of the **flow gate** collection.

Each of the **flow gate** validated orders may contain prices for their respective **flow gate** . The agreed amount would be calculated based upon the associated amounts and pricing of the **flow gates** . Alternatively, all validated orders may have a price associated with them.

These operations may be...computer showing an ordering screen for hourly time interval based market intervals for a specific **flow gate** market in accordance with certain embodiments of the invention.

The displayed information 4200 includes a variety of fields, including field 4202, where a specific **flow gate** or intertie may be selected. Immediately 20 below that field is a field which specifies...

...entries from 1 to 24, indicating the hourly AC power transfer markets 4204 in the **flow gate** location "COCOPP Unit 1" 4202. Consider the row labeled by the hour 4208 ending at...

...row displays the market state of the market interval with AC power transfer product type, **flow gate** 4202 location and hour time interval ending at 1:00 for May 10, 1999. The...

3/KWIC/6 (Item 6 from file: 349)

DIALOG(R)File 349:(c) 2003 WIPO/Univentio. All rts. reserv.

Fulltext Availability:

Detailed Description

Detailed Description

... that different transformers may have differing transformer capacity limits.

These constrained flow elements are called **flow gates** . In the last few years

the importance of **flow gates** has begun to emerge through the actions of

NERC, which has been responsible for building a model estimating **flow gate** impact, which can be downloaded from their web site.

io A **flow gate** of a given AC power network will refer herein to a collection of at least...

...of that network.

All lines have maximum safe carrying capacities and thus could be considered **flow gates** , of a sort. However, historical congestion analysis of specific AC power networks reveals that only a small number of **flow gates** account for almost all congestion problems. Such **flow gates** will be herein referred to as significant **flow gates** .

The associated AC power transfer across a given **flow gate** is additive due to

the super positioning effects previously discussed. Thus in sending 100 megawatts along a path, the transmission may have a 10% impact on the **flow gate** , putting 10 megawatts on the **flow gate** . A second generator may have a

5% impact on that **flow gate** . Generating 100 megawatt at the second generator would add 5 across the **flow gate** .

Figure 1 depicts an exemplary AC power network based upon contemporary AC power technology as...between node 100 and node 110. Line 112 runs between node 110 and node 120.

**Flow gate** A 210 is a constraint on the network. Lines 32, 34 and 42

are  
constrained by **flow gate** A 210 by a total maximum safe carrying  
capacity, in  
that these lines have transmission capacity limitations which are easily  
overloaded when this maximum safe carrying capacity is exceeded.

**Flow gate** B 220 is a constraint on the network. Lines 42 and 44 are  
constrained by **flow gate** B 220. These lines are also constrained by a  
total  
maximum safe carrying capacity due...

...as their  
proximity at some critical junction of the system, such as a mountain  
pass.

**Flow gate** C 230 is a constraint on the network. Lines 52 and 62 are  
constrained by **flow gate** C 230 to a total maximum safe carrying  
capacity.

Figure 2 depicts a list of associated AC power functions for each **flow  
gate** of a collection of **flow gates** for each of the busses of the  
various nodes of the exemplary AC power network...

...an essentially linear effect on all  
transmission lines in the network, and consequently impact all **flow  
gates** within that network to some extent.

This contract path system of scheduling power transmission reserves...  
making up the direct path. It often occurs that some constraint,  
occurring across a significant **flow gate** off that direct path,  
actually limits the transmission capability on the direct path.

9  
n6ar...

...to  
purchase separately transmission from A to C. This is because there might  
be some **flow gate** constraint which would not be met in the two  
separate paths  
which would be triggered...

...are issued across apparently irrelevant contracted  
paths to compensate. The central operator acts, because a **flow gate**  
will  
overflow, forbidding transmission often across apparently irrelevant  
paths to compensate.

10  
SUBSTITUTE SHEET (RULE226611...

...that could contribute to market efficiency and price stability.

NERC has developed a methodology addressing **flow gates** to some  
extent.

This is discussed in a document entitled "Discussion Paper on Aligning  
Transmission...

...shift to a system of reserving and scheduling transmission  
based on actual use of congested **flow gates**, which they called the  
FLOWBAT method. Their proposal suffers from a serious omission, it does

not address the issue of allocating **flow gate** capacity when demand exceeds supply. By their silence on this issue, it appears that they... case called Transaction Participation Functions (TPFs).

These distribution functions refer to transmission paths rather than **flow gates** .

GAPP attempts to align compensation paid by transmission users with actual power flows. However, GAPP...

...the physics of AC power networks. Further, since transmission rights are predominantly constrained by significant **flow gates** , what is needed should account for the effect on the significant **flow gates** for each contracted transmission. A method and mechanism is needed for planning the operations of...the prior art; Figure 2 depicts a list of associated AC power functions for each **flow gate** of io a collection of **flow gates** for each of the busses of the various nodes of the exemplary AC power network...are not limited to acoustic interfaces to humans, audio and visual identification portals to the **contracting** of AC **power transfer** regarding **flow gates** , encoding and decoding mechanisms used in long distance communication and interfaces to recording devices of agreed **contracts** .

A program step as used herein refers to instructions in a form that either by...

3/KWIC/7 (Item 7 from file: 349)

DIALOG(R) File 349: (c) 2003 WIPO/Univentio. All rts. reserv.

Fulltext Availability:  
Claims

Claim

... of said AC power transfer collection on each of said flow gates of said flow **gate** collection comprises;  
a program code segment supporting said sum of said associated AC  
1 5...

...AC power transfer collection satisfying said associated maximum safe carrying capacity on each of said **flow gates** of said **flow gate** collection.

29 The program operating system of Claim 27,  
wherein each of said AC power transfers of said AC **power transfer** collection is to take place over a first time interval; and  
wherein said program code segment supporting **contracting** said sum of said associated AC **power transfer** for each of said AC power transfers of said AC **power transfer** collection on each of said **flow gates** of said **flow gate** collection comprises;  
a program code segment supporting **contracting** said sum of said associated AC **power transfer** for each of said AC power transfers of said A C **power transfer** collection to take place at least over at least said first time interval on each of said **flow gates** of said **flow gate** collection.

30 The program operating system of Claim 27,  
wherein each of said AC power...

...to a second node of said AC power network; and  
said program code segment supporting **contracting** said sum of said  
associated AC **power transfer** for each of said AC power transfers of  
said AC **power transfer** collection on each of said **flow gates** of  
said **flow gate** collection  
comprises  
q17  
a program code segment essentially calculating an amount of energy of  
said associated AC power transfer on each of said **flow gates** of said  
**flow gate** collection as essentially an associated linear,  
skew-symmetric function of said associated amount of energy...  
...associated second node.

31 The program operating system of Claim 25,  
wherein each of said **flow gates** of said **flow gate** collection is a  
significant **flow gate** of said AC power network.

32 The program operating system of Claim 25,  
wherein each significant **flow gate** of said AC power network is a  
**flow gate** in said **flow gate** collection.

33 The program operating system of Claim 25,  
wherein said program code segment supporting **contracting** for said AC  
**power transfer** on said AC power network further comprises;  
1 5 a program code segment supporting **contracting** for said AC **power**  
**transfer** on said AC power network to create an agreed **contract** by a  
first party to own AC **power transfer** trading rights with associated  
AC power transfers on  
each of said **flow gates** of said **flow gate** collection; and  
a program code segment supporting enabling said first party to further  
**contract** to sell said first party owned AC **power transfer** trading  
rights.

34 The program operating system of Claim 33,  
wherein each of said **flow gates** of said **flow gate** collection has  
an  
associated maximum safe carrying capacity; and  
further comprising a program code segment supporting scheduling said  
AC **power transfer** for said agreed **contract** comprising;  
a program code segment supporting determining whether said associated  
AC **power transfer** of said **flow gate** of said **flow gate**  
collection satisfies said associated maximum safe carrying capacity of  
said **flow gate** for each of said **flow**  
**gates** of said **flow gate** collection; and  
a program code segment supporting approving said AC power transfer  
whenever said associated AC power transfer of said **flow gate**  
satisfies said maximum safe carrying capacity for each said **flow gates**  
of said **flow gate** collection.

35 The program operating system of Claim 34,  
wherein performing said program code segment supporting enabling said  
first party to further **contract** to sell said first party owned AC  
**power transfer** trading rights occurs before performing said program  
code segment supporting scheduling said AC **power transfer** for said  
agreed **contract** .

36 The program operating system of Claim 34,  
wherein said agreed **contract** by said first party to own said AC **power**

**transfer** trading rights is to take place over a first time interval;  
and  
wherein performing said program code segment supporting scheduling  
said AC **power transfer** for said agreed **contract** occurs before said  
first time I 0 interval.

37 The program operating system of Claim 36,  
wherein determining whether said associated AC power transfer of said  
**flow gate** of said **flow gate** collection satisfies said associated  
maximum safe carrying capacity of said **flow gate** for each of said  
**flow gates** of said **flow gate**  
1 5 collection further comprises;  
determining whether said associated AC power transfer of said **flow**  
**gate**  
of said **flow gate** collection satisfies said associated maximum safe  
carrying capacity of said **flow gate** for each of said **flow gates**  
of said **flow gate** collection  
over said first time interval; and  
wherein approving said AC power transfer whenever said associated A C  
power transfer of said **flow gate** satisfies said maximum safe carrying  
capacity for  
each of said **flow gates** of said **flow gate** collection further  
comprises;  
approving said AC power transfer over said first time interval whenever  
said associated AC power transfer of said **flow gate** satisfies said  
maximum safe 2 5 carrying capacity for each said **flow gates** of said  
**flow gate** collection over said first time interval.

38 The program operating system of Claim 37, further comprising:  
a program code segment supporting **contracting** for an AC **power**  
**transfer**  
collection of at least one AC **power transfer** to create an agreed  
**contract** by a first  
party to own AC **power transfer** trading rights with associated AC  
power  
transfers on each of said **flow gates** of said **flow gate** collection  
further comprises;  
a program code segment supporting **contracting** for a sum of associated  
AC power transfers for all AC power transfers of said AC **power**  
**transfer**  
collection to create a **contract** for an associated AC **power transfer**  
for said collection of AC power transfers for each of said **flow gates**  
of said **flow gate** collection.  
. The program operating system of Claim 38,  
wherein each of said AC power transfers...

...to said second node of said AC power network;  
wherein a program code segment supporting **contracting** for a sum of  
associated AC power transfers for all AC power transfers of said AC  
**power transfer** collection to create a **contract** for an associated AC  
**power transfer** for said collection of AC power transfers for each of  
said **flow gates** of said **flow gate**  
collection comprises;  
a program code segment calculating each of said associated AC power  
transfers on said **flow gate** of said AC power transfer has an amount  
of energy as an essentially linear, skew...

...node to said associated second node of said AC power transfer of each of  
said **flow gates** of said **flow gate** collection.  
1 5 40. The program operating system of Claim 33,

wherein said program code segment supporting enabling said first party to further **contract** to sell said first party owned AC **power transfer** trading rights further comprises;  
a program code segment supporting enabling said first party to further **contract** to sell said first party owned AC **power transfer** trading rights for said associated AC **power transfer** for a first of said **flow gates** of said **flow gate** collection.

41 The program operating system of Claim 40,  
wherein said program code segment supporting enabling said first party to further **contract** to sell said first party owned AC **power transfer** trading rights further comprises;  
a program code segment supporting enabling said first party to further **contract** to sell said first party owned AC **power transfer** trading rights for said associated AC **power transfer** for each of said **flow gates** of said **flow gate** collection.

42 The program operating system of Claim 33,  
wherein said first party is a...

...by said first party to act on behalf of said first party with respect to **contracting** said AC **power transfer** .

45 The program operating system of Claim 25,  
wherein said computing system is further comprised...

...of said server computers of said server system; and  
wherein said program code segment supporting **contracting** said A C **power transfer** on said AC power network further comprises;  
1 5 a program code segment residing in...

...received stimulus stream and said received server stream; and  
wherein said program code segment supporting **contracting** said A C **power transfer** on said AC power network further comprises;  
a program code segment supporting communicating via said...

...stream.

47 The program operating system of Claim 46,  
wherein said program code segment supporting **contracting** AC **power transfer** on said AC power network further comprises;

53

a program code segment supporting operating a...

...trading floor  
containing a market interval for trading AC power transfer for each of said **flow gates** of said **flow gate** collection further comprising;  
a program code segment supporting transforming said received server delivery stream into...

...one bid order and at least one ask order; and  
a program code segment supporting **contracting** AC **power transfer** on said AC power network to create an agreed **contract** based upon a first of said bid orders of said order collection and ...a collection comprising a bid type and an ask type;

wherein program code segment supporting **contracting** said AC **power transfer** on said AC power network to create an agreed **contract** further comprises  
a program code segment supporting **contracting** said AC **power transfer**

on  
said AC power network to create an agreed **contract** based upon a first bid type order of said validated orders of said validated order...

...of said validated order collection.

49 The program operating system of Claim 48,  
wherein supporting **contracting** for said AC **power transfer** on said AC power network to create an agreed **contract** by a first party to own AC **power transfer** trading rights with associated AC power transfers on each of said **flow gates** of said **flow gate** collection further comprises;  
a program code segment supporting **contracting** for said AC **power transfer** on said AC power network to create an agreed **contract** by a first party to own AC **power transfer** trading rights with associated AC power transfers on each of said **flow gates** of said **flow gate** collection based upon a first bid type order of said validated orders of said validated...

...operating system of Claim 48,  
wherein at least one market interval is associated with each **flow gate** of said **flow gate** collection.

51 The program operating system of Claim 50,  
5A@,  
wherein said server system is...

...computing system supporting program operating system of program  
io code segments with program code segments **contracting** an AC **power transfer** on an AC power network with a **flow gate** collection containing at least one **flow gate**, comprised of:  
at least one computer, each of said computers in said computing system coupled...

...in said computing  
system;

wherein said program operating system contains a program code segment supporting **contracting** an AC **power transfer** on said AC power  
2o network further comprising;  
a program code segment supporting **contracting** an associated AC **power transfer** on each of said **flow gates** of said **flow gate** collection.

53 A computing system of Claim 52,  
wherein said program code segment supporting **contracting** for said AC **power transfer** on said AC power network further comprises;  
a program code segment supporting **contracting** for said AC **power transfer** on said AC power network to create an agreed **contract** by a first party to own AC **power transfer** trading rights with associated AC power transfers on each of said **flow gates** of said **flow gate** collection; and  
a program code segment supporting enabling said first party to further **contract** to sell said first party owned AC **power transfer** trading rights.

54 A computing system of Claim 53,  
wherein each of said **flow gates** of said **flow gate** collection has  
an  
associated maximum safe carrying capacity; and  
said program operating system further containing a program code  
segment supporting scheduling said AC **power transfer** for said agreed  
**contract**  
comprising;  
a program code segment supporting determining whether said associated  
AC **power transfer** of said **flow gate** of said **flow gate**  
collection satisfies said associated maximum safe carrying capacity of  
said **flow gate** for each of said **flow**  
**gates** of said **flow gate** collection; and  
a program code segment supporting approving said AC power transfer  
whenever said associated AC power transfer of said **flow gate**  
satisfies said maximum safe carrying capacity for each said **flow gates**  
of said **flow gate** collection.

55 A computing system of Claim 54, further comprised of:  
a client computer collection...

...of said server computers of said server  
system; and  
wherein said program code segment supporting **contracting** said A C  
**power transfer** on said AC power network further comprises  
a program code segment residing in said computer...  
...received stimulus stream and said received server stream; and  
wherein said program code segment supporting **contracting** said A C  
**power transfer** on said AC power network further comprises;  
57P  
a program code segment supporting communicating via...delivery stream.

57 A computing system of Claim 56,  
wherein said program code segment supporting **contracting** AC **power**  
**transfer** on said AC power network further comprises;  
a program code segment supporting operating a virtual trading floor  
containing a market interval for trading AC power transfer for each of  
said **flow**  
**gates** of said **flow gate** collection further comprising  
a program code segment supporting transforming said received server  
i o delivery...

...one bid order and at  
least one ask order; and  
a program code segment supporting **contracting** AC **power transfer** on  
said AC power network to create an agreed **contract** based upon a first  
of said bid orders of said order collection and based upon...  
...collection comprising a bid type and an ask type;  
wherein said program code segment supporting **contracting** said A C  
**power transfer** on said AC power network to create an agreed **contract**  
further  
comprises;  
a program code segment supporting **contracting** said AC **power transfer**  
  
on said AC power network to create an agreed **contract** based upon a  
first bid type order of said validated orders of said validated order...  
...order collection.

59 A computing system of Claim 58,  
 wherein said program code segment supporting **contracting** for said A C  
**power transfer** on said AC power network to create an agreed **contract**  
 by a first  
 party to own AC **power transfer** trading rights with associated AC  
 power  
 transfers on each of said **flow gates** of said **flow gate** collection  
 further comprises;  
 a program code segment supporting **contracting** for said AC **power**  
**transfer** on said AC power network to create an agreed **contract** by a  
 first party to own AC **power transfer** trading rights with associated.  
 AC power transfers on each of said **flow gates** of said **flow gate**  
 collection based upon a first bid type order of said validated orders of  
 said validated...

...computing system of Claim 59. wherein at least one market interval is  
 associated with each **flow gate** of said **flow gate** collection.

61 A computing system of Claim 60,  
 wherein said server system is further comprised...  
 ...A method for contracting AC power transfer on an AC power network with  
 a **flow gate** collection containing at least one **flow gate**  
 comprising:  
**contracting** an AC **power transfer** on said AC power network to take  
 place  
 over a first time interval comprising:  
**contracting** an associated AC **power transfer** on each of said **flow**  
**gates** of said **flow gate** collection to take place over at least said  
 first time interval; and  
**contracting** an AC power transfer collection of at least two AC power  
 transfers on an AC power network further comprises:  
 contracting a sum of said associated AC **power transfer** for each of  
 said  
 AC power transfers of said AC **power transfer** collection on each of  
 said **flow gates** of said **flow gate** collection.

2 The method of Claim 62,  
 wherein **contracting** for AC **power transfer** on said AC power network  
 comprises:  
**contracting** for AC **power transfer** on said AC power network to take  
 place  
 over a first time interval; and  
 wherein **contracting** said associated AC **power transfer** on each of  
 said  
 flow gates of said flow gate collection comprises  
**contracting** said associated AC **power transfer** on each of said **flow**  
**gates**  
 of said **flow gate** collection to take place over at least said first  
 time interval.

3 The method of Claim 2, further comprising:  
 contracting an AC **power transfer** collection of at least two AC power  
 transfers on an AC power network further comprises  
**contracting** a sum of said associated AC **power transfer** for each of  
 said  
 AC power transfers of said AC **power transfer** collection on each of  
 said **flow gates** of said **flow gate** collection.

4 The method of Claim 19

wherein each **flow gate** of said **flow gate** collection has an associated maximum safe carrying capacity; and wherein **contracting** said sum of said associated AC **power transfer** for each of said AC power transfers of said AC **power transfer** collection on each of said **flow gates** of said **flow gate** collection comprises

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said sum of said associated AC power transfer...

...AC power transfer collection satisfying said associated maximum safe carrying capacity on each of said **flow gates** of said **flow gate** collection.

5 The method of Claim 1,

wherein each of said AC power transfers of said AC **power transfer** collection is to take place over a first time interval; and wherein **contracting** said sum of said associated AC **power transfer** for each of said AC power transfers of said AC **power transfer** collection on each of

said **flow gates** of said **flow gate** collection comprises

**contracting** each of said sum of said associated AC **power transfer** for each of said AC power transfers of said AC **power transfer** collection to take place at ...said AC power network to a second node of said AC power network; and

wherein **contracting** said sum of said associated AC **power transfer** for

each of said AC power transfers of said AC **power transfer** collection on each of

said **flow gates** of said **flow gate** collection comprises

**contracting** an amount of energy of said associated AC **power transfer** on

each of said **flow gates** of said **flow gate** collection as essentially an associated linear, skew-symmetric function of said associated amount of energy...

...first node to said associated second node.

9 The method of Claim 1 9

wherein **contracting** for said AC **power transfer** on said AC power network comprises

**contracting** for said AC **power transfer** on said AC power network to create an agreed **contract** by a first party to own AC **power transfer** trading rights with associated AC power transfers on each of said **flow gates** of said **flow gate** collection; and

enabling said first party to further **contract** to sell said first party owned AC **power transfer** trading rights.

11 The method of Claim 1 0,

wherein enabling said first party to further **contract** to sell said first party

owned AC **power transfer** trading rights comprises

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enabling said first party to further **contract** to sell said first party

owned A C **power transfer** trading rights before scheduling said AC **power transfer** for said agreed **contract** .

13 The method of Claim 12,  
wherein determining whether said associated AC **power transfer** of said **flow gate** of said **flow gate** collection satisfies said associated maximum safe carrying capacity of said **flow gate** for each of said **flow gates** of said **flow gate** collection further comprises  
determining whether said associated AC power transfer of said **flow gate**

i o of said **flow gate** collection satisfies said associated maximum safe carrying capacity of said **flow gate** for each of said **flow gates** of said **flow gate** collection over said first time interval; and  
wherein approving said AC power transfer whenever said associated A C power transfer of said **flow gate** satisfies said maximum safe carrying capacity for

i5 each said **flow gate** of said **flow gate** collection further comprises  
approving said AC power transfer over said first time interval whenever said associated AC power transfer of said **flow gate** satisfies said maximum safe carrying capacity for each said **flow gates** of said **flow gate** collection over said first time interval.

14 The method of Claim 13, further comprising:  
**contracting** for an AC **power transfer** collection of at least one AC **power**

**transfer** to create an agreed **contract** by a first party to own AC **power transfer** trading rights with associated AC power transfers on each of said **flow gates** of said **flow gate** collection further compdses  
**contracting** for a sum of associated AC power transfers for all AC power transfers of said AC **power transfer** collection to create a **contract** for an associated AC **power transfer** for said collection of AC power transfers for each of said **flow gates** of said **flow gate** collection.

15 The method of Claim 14,  
wherein each of said AC power transfers of...

...of  
said AC power network to said second node of said AC power network;  
wherein **contracting** for a sum of associated AC. power transfers for all A C power transfers of said AC **power transfer** collection to create a **contract** for an associated AC **power transfer** for said collection of AC power transfers for each  
of said **flow gates** of said **flow gate** collection comprises

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calculating said associated AC power transfer on said **flow gate** of said

AC power transfer as an amount of energy which is an essentially linear

...

...transfer to said associated second node of said AC power transfer of each of said **flow gates** of said **flow gate** collection.

16 The method of Claim 9,  
wherein enabling said first party to further **contract** to sell said first party

owned AC **power transfer** trading rights further comprises  
I 0 enabling said first party to further **contract** to sell said first  
party owned A C **power transfer** trading rights for said associated AC  
**power transfer** for a first of said **flow gates** of said flow gate  
collection.

17 The method of Claim 16,  
wherein enabling said first party to further **contract** to sell said  
first party  
1 5 owned AC **power transfer** trading rights further comprises  
enabling said first party to further **contract** to sell said first party  
owned A C **power transfer** trading rights for said associated AC **power  
transfer** for each of said **flow gates** of said flow gate  
collection.

23 The method of Claim 22, further comprising:  
a first client user operating said...

...interactive status based upon said received stimulus stream  
and said received server stream; and  
wherein **contracting** said AC **power transfer** on said AC power network  
further comprises  
communicating via said network with said first client computer to create  
a received server delivery stream.

24 The method of Claim 23,  
wherein **contracting** AC **power transfer** on said AC power network  
further  
comprises  
62

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operating a virtual trading floor containing a market for trading AC  
power transfer for each of said **flow gates** of said **flow gate**  
collection further comprising transforming said received server delivery  
stream into an order collection  
containing at least one bid order and at least one ask order, and  
**contracting** AC **power transfer** on said AC power network to create an  
agreed **contract** based upon a first of said bid orders of said order  
collection and based upon...

...with  
program code segments **contracting** AC power **transfer** on an AC power  
network with a **flow gate** collection containing at least one **flow  
gate**, comprising:  
a program code segment supporting **contracting** an AC **power transfer**  
on  
said AC power network to take place over a first time interval  
comprising:  
1 5 a program code segment supporting **contracting** an associated AC  
**power transfer** on each of said **flow gates** of said flow gate  
collection to take place over  
at least said first time interval; and  
a program code segment supporting **contracting** an AC **power transfer**  
collection of at least two AC power transfers on an AC power network to  
take  
place over said first time interval further comprises:  
a program code segment supporting **contracting** a sum of said associated  
AC power transfers for each of said AC power transfers of said AC **power  
transfer** collection on each of said **flow gates** of said flow gate

collection to take place at least over at least said first time.

26 The program operating system of Claim 63,  
wherein said program code segment supporting **contracting** an AC **power transfer** on said AC power network comprises  
a program code segment supporting **contracting** an AC **power transfer** on  
said AC power network to take place over a first time interval; and  
wherein said program code segment supporting **contracting** said  
associated AC **power transfer** on each of said **flow gates** of said  
**flow gate**  
collection comprises  
a program code segment supporting **contracting** said associated A C  
**power transfer** on each of said **flow gates** of said **flow gate**  
collection to take place over at least said first time interval.

28 The program operating system of Claim 25,  
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wherein each **flow gate** of said **flow gate** collection has an  
associated  
maximum safe carrying capacity; and  
wherein said program code segment supporting **contracting** said sum of  
said associated AC **power transfer** for each of said AC power transfers  
of said AC **power transfer** collection on each of said **flow gates**  
of said **flow gate**  
collection comprises  
a program code segment supporting said sum of said associated AC  
power transfer...

...power transfer collection satisfying said associated maximum safe  
carrying capacity on each of io said **flow gates** of said **flow gate**  
collection.

29 The program operating system of Claim 27,  
wherein each of said AC power transfers of said AC **power transfer**  
collection is to take place over a first time interval; and  
wherein said program code segment supporting **contracting** said sum of  
1 5 said associated AC **power transfer** for each of said AC power  
transfers of said AC **power transfer** collection on each of said **flow**  
**gates** of said **flow gate**  
collection comprises  
a program code segment supporting **contracting** said sum of said  
associated AC **power transfer** for each of said AC power transfers of  
said AC **power transfer** collection to take place at least over at  
least said first time interval on each of said **flow gates** of said  
**flow gate** collection.

30 The program operating system of Claim 25,  
wherein each of said AC power...

...to a second node of said AC power network; and  
said program code segment supporting **contracting** said sum of said  
associated AC **power transfer** for each of said AC power transfers of  
said A C **power transfer** collection on each of said **flow gates** of  
said **flow gate** collection  
comprises  
a program code segment essentially calculating an amount of energy of  
said associated AC power transfer on each of said **flow gates** of said  
**flow gate** collection as essentially an associated linear,

skew-symmetric function of said associated amount of energy...

...node.

33 The program operating system of Claim 25,  
wherein said program code segment supporting **contracting** for said A C  
**power transfer** on said AC power network further comprises

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a program code segment supporting **contracting** for said AC **power transfer** on said AC power network to create an agreed **contract** by a first party to own AC **power transfer** trading rights with associated AC power transfers on each of said **flow gates** of said **flow gate** collection; and a program code segment supporting enabling said first party to further **contract** to sell said first party owned AC **power transfer** trading rights.

34 The program operating system of Claim 33,  
wherein each of said **flow gates** of said **flow gate** collection has an associated maximum safe carrying capacity; and further comprising a program code segment supporting scheduling said AC **power transfer** for said agreed **contract** comprising a program code segment supporting determining whether said associated AC **power transfer** of said **flow gate** of said **flow gate** collection satisfies said associated maximum safe carrying capacity of said **flow gate** for each of said **flow gates** of said **flow gate** collection; and a program code segment supporting approving said AC power transfer whenever said associated AC power transfer of said **flow gate** satisfies said maximum safe carrying capacity for each said **flow gates** of said **flow gate** collection.

2o 37. The program operating system of Claim 36,  
wherein determining whether said associated AC power transfer of said **flow gate** of said **flow gate** collection satisfies said associated maximum safe carrying capacity of said **flow gate** for each of said **flow gates** of said **flow gate** collection further comprises determining whether said associated AC power transfer of said **flow gate** of said **flow gate** collection satisfies said associated maximum safe carrying capacity of said **flow gate** for each of said **flow gates** of said **flow gate** collection over said first time interval; and wherein approving said AC power transfer whenever said associated A C power transfer of said **flow gate** satisfies said maximum safe carrying capacity for each of said **flow gates** of said **flow gate** collection further comprises approving said AC power transfer over said first time interval whenever said associated AC power transfer of said **flow gate** satisfies said maximum safe carrying capacity for each said **flow gates** of said **flow gate** collection over said first time interval.

38 The program operating system of Claim 37, further comprising:

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a program code segment supporting **contracting** for an AC **power transfer**

collection of at least one AC **power transfer** to create an agreed **contract** by a first party to own AC **power transfer** trading rights with associated AC power transfers on each of said **flow gates** of said **flow gate** collection further comprises a program code segment supporting **contracting** for a sum of associated AC power transfers for all AC power transfers of said AC **power**

**transfer** collection to create a **contract** for an associated AC **power transfer** for said collection of AC power transfers for each of said **flow gates** of said **flow gate** collection.  
I o 39. The program operating system of Claim 38, wherein each of said...

...to said second node of said AC power network;  
wherein a program code segment supporting **contracting** for a sum of associated AC power transfers for all AC power transfers of said AC **power transfer** collection to create a **contract** for an associated AC **power transfer** for said collection of AC power transfers for each of said **flow gates** of said **flow gate** collection comprises a program code segment calculating each of said associated AC power transfers on said **flow gate** of said AC power transfer has an amount of energy as an essentially linear, skew...

...node to said associated second node of said AC power transfer of each of said **flow gates** of said **flow gate** collection.

40 The program operating system of Claim 33, wherein said program code segment supporting enabling said first party to further **contract** to sell said first party owned AC **power transfer** trading fights further comprises a program code segment supporting enabling said first party to further **contract** to sell said first party owned AC **power transfer** trading rights for said 3o associated AC **power transfer** for a first of said **flow gates** of said **flow gate** collection.

41 The program operating system of Claim 40, wherein said program code segment supporting enabling said first party to further **contract** to sell said first party owned AC **power transfer** trading rights further comprises a program code segment supporting enabling said first party to further **contract** to sell said first party owned AC **power transfer** trading rights for said

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associated AC **power transfer** for each of said **flow gates** of said **flow gate** collection.

45 The program operating system of Claim 25, wherein said computing system is further...

...of said server computers of said server system; and wherein said program code segment supporting **contracting** said AC **power transfer** on said AC power network further comprises a program code segment residing in said computer...

...received stimulus stream and said received server stream; and  
wherein said program code segment supporting **contracting** said A C  
**power transfer** on said AC power network further comprises  
a program code segment supporting communicating via said...

...stream.

47 The program operating system of Claim 46,  
wherein said program code segment supporting **contracting** AC **power**  
**transfer** on said AC power network further comprises

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a program code...

...trading floor

containing a market interval for trading AC power transfer for each of  
said **flow**

**gates** of said **flow gate** collection further comprising  
a program code segment supporting transforming said received server  
delivery stream into...collection.

49 The program operating system of Claim 48,  
wherein supporting **contracting** for said AC **power transfer** on said A C  
power network to create an agreed **contract** by a first party to own AC  
**power transfer** trading rights with associated AC power transfers on  
each of said **flow**

1 5 **gates** of said **flow gate** collection further comprises  
a program code segment supporting **contracting** for said AC **power**  
**transfer** on said AC power network to create an agreed **contract** by a  
first party to own AC **power transfer** trading rights with associated  
AC power transfers on each of said **flow gates** of said **flow gate**  
collection based upon a first bid type order of said validated orders of  
said validated...

...A computing system supporting program operating system of program  
code segments with program code segments **contracting** an AC **power**  
**transfer** on an AC power network with a **flow gate** collection  
containing at least one **flow**  
**gate** , comprised of:  
at least one computer, each of said computers in said computing system  
coupled...

...in said computing

system;

wherein said program operating system contains a program code  
segment supporting **contracting** an AC **power transfer** on said AC  
power

network further to take place over a first time interval comprising:

a program code segment supporting **contracting** an associated AC **power**  
**transfer** on each of said **flow gates** of said **flow gate**  
collection to take place over

at least said first time interval; and

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a program code segment supporting **contracting** an AC **power transfer**  
collection of at least two AC power transfers on an AC power network to  
take

place over said first time interval further comprises:

a program code segment supporting **contracting** a sum of said associated

AC power transfers for each of said AC power transfers of said AC **power transfer** collection on each of said **flow gates** of said **flow gate** collection to take place at least over at least said first time.

53 A computing system of Claim 52, wherein said program code segment supporting **contracting** for said AC **power transfer** on said AC power network further comprises a program code segment supporting **contracting** for said AC **power transfer** on said AC power network to create an agreed **contract** by a first party to own AC **power transfer** trading rights with associated AC power transfers on each of said **flow gates** of said **flow gate** collection; and a program code segment supporting enabling said first party to further **contract** to sell said first party owned AC **power transfer** trading rights.

54 A computing system of Claim 53, wherein each of said **flow gates** of said **flow gate** collection has an associated maximum safe carrying capacity; and said program operating system further containing...

...comprising a program code segment supporting determining whether said associated AC power transfer of said **flow gate** of said **flow gate** collection satisfies said associated maximum safe carrying capacity of said **flow gate** for each of said **flow gates** of said **flow gate** collection; and a program code segment supporting approving said AC power transfer whenever said associated AC power transfer of said **flow gate** satisfies said maximum safe carrying capacity for each said **flow gates** of said **flow gate** collection.

56 A computing system of Claim 55, wherein said program operating system further comprising...

...received stimulus stream and said received server stream; and wherein said program code segment supporting **contracting** said A C **power transfer** on said AC power network further comprises a program code segment supporting communicating via said...

...i o 57. A computing system of Claim 56, wherein said program code segment supporting **contracting** AC **power transfer** on said AC power network further comprises a program code segment supporting operating a virtual trading floor containing a market interval for trading AC power transfer for each of said **flow gates** of said **flow gate** collection further comprising a program code segment supporting transforming said received server delivery stream into...

...one bid order and at least one ask order, and a program code segment supporting **contracting** AC **power transfer** on said AC power network to create an agreed **contract** based upon a first of said bid orders of said order collection and based upon...

...collection comprising a bid type and an ask type; wherein said program code segment supporting **contracting** said A C **power transfer** on said AC power network to create an agreed **contract**

further  
comprises  
a program code segment supporting **contracting** said AC **power transfer**

on said AC power network to create an agreed **contract** based upon a  
first bid type order of said validated orders of ...order collection.

59 A computing system of Claim 58,  
wherein said program code segment supporting **contracting** for said A C  
**power transfer** on said AC power network to create an agreed **contract**  
by a first  
party to own AC **power transfer** trading rights with associated AC  
power  
transfers on each of said **flow gates** of said **flow gate** collection  
further comprises

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a program code segment supporting **contracting** for said AC **power transfer**  
**transfer** on said AC power network to create an agreed **contract** by a  
first party to own AC **power transfer** trading rights with associated  
AC power transfers on each of said flow g ates of said **flow gate**  
-collection based upon a first bid type order of said validated orders of  
said validated...

...type order of said validated orders of said validated order collection.

62 A method for **contracting** AC **power transfer** on an AC power  
network with  
a **flow gate** collection containing at least one **flow gate**  
comprising:

**contracting** an AC **power transfer** on said AC power network  
comprising  
I 0 **contracting** an associated AC **power transfer** on each of said  
**flow gates** of said **flow gate** collection.

63 A program operating system executing on a computing system  
comprised of at least...

...said computing system coupled to an associated computer readable memory,  
supporting with

program code segments **contracting** AC **power transfer** on an AC power  
network with a **flow gate** collection containing at least one **flow**  
**gate** , comprising:

a program code segment supporting **contracting** an AC **power transfer**  
on  
said AC power network comprising  
a program code segment supporting **contracting** an associated AC **power transfer**  
**transfer** on each of said **flow gates** of said□flow gate□  
collection.

64 A computing system supporting program operating system of program  
code segments with program code segments **contracting** an AC **power transfer**  
**transfer** on an AC power network with a **flow gate** collection  
containing at least one **flow**  
**gate** , comprised of:  
at least one computer, each of said computers in said computing system  
coupled...

...in said computing  
system;

wherein said program operating system contains a program code segment supporting **contracting** an AC **power transfer** on said AC power network further comprising a program code segment supporting **contracting** an associated AC **power transfer** on each of said **flow gates** of said **flow gate** collection.

7 1

AMENDED SHEET (ARTICLE 19)  
Amendment under Article 19 U1  
Claims 62 to...

**3/KWIC/8 (Item 8 from file: 349)**

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Fulltext Availability:  
Detailed Description  
Claims

#### Detailed Description

... that different transformers may have differing transformer capacity limits.

These constrained flow elements are called **flow gates**. In the last few years the importance of **flow gates** has begun to emerge through the actions of NERC, which has been responsible for building a model estimating **flow gate** impact, which can be downloaded from their web site.

io A **flow gate** of a given AC power network will refer herein to a collection of at least...

...network.

All lines have maximum safe carrying capacities and thus could be considered 1 5 **flow gates**, of a sort. However, historical congestion analysis of specific AC power networks reveals that only a small number of **flow gates** account for almost all congestion problems. Such **flow gates** will be herein referred to as significant **flow gates**.

The associated AC power transfer across a given **flow gate** is additive due to the super positioning effects previously discussed. Thus in sending 100 megawatts along a path, the transmission may have a 1 0% impact on the **flow gate**, putting 10 megawatts on the **flow gate**. A second generator may have a 5% impact on that **flow gate**. Generating 100 megawatt at the second generator would add 5 across the **flow gate**.

Figure I depicts an exemplary AC power network based upon contemporary AC power technology as...an essentially linear effect on all transmission lines in the network, and consequently impact all **flow gates** within that network to some extent.

This contract path system of scheduling power transmission reserves...making up the direct path. It often occurs that some constraint, occurring across a significant **flow gate** off that direct path, actually limits the transmission capability on the direct path.

00  
The...

...to  
purchase separately transmission from A to C. this is because there might  
be some **flow gate** constraint which would not be met in the two  
separate paths  
which would be triggered...are issued across apparently irrelevant  
contracted  
paths to compensate. The central operator acts, because a **flow gate**  
will  
overflow, forbidding transmission often across apparently irrelevant  
paths to compensate.

Another alternative approach is...

...to imagine that such a situation could be optimal.  
NERC has developed a methodology addressing **flow gates** to some  
extent.

3o This is discussed in a document entitled "Discussion Paper on Aligning  
...

...shift to a system of reserving and scheduling transmission  
based on actual use of congested **flow gates** , which they called the  
FLOWBAT method. Their proposal suffers from a serious omission, it does  
not address the issue of allocating **flow gate** capacity when demand  
exceeds supply. By their silence on this issue, it appears that they...

...case called Transaction Participation Functions (TPFs).

These distribution functions refer to transmission paths rather than  
**flow gates** .

GAPP attempts to align compensation paid by transmission users with  
actual power flows. However, GAPP...

...the physics of AC power networks. Further,  
since transmission rights are predominantly constrained by significant  
**flow gates** , what is needed should account for the effect on the  
significant **flow**  
**gates** for each contracted transmission. A method and mechanism is  
needed  
for trading generation and transmission...further embodiments include an  
AC power network in the electrical power grid further containing a **flow**  
**gate** collection. For each **flow gate** of the **flow gate**  
collection, there is at least one market interval with AC power  
transfer product type and location of the **flow gate** . Such embodiments  
advantageously provide a trading mechanism for AC power transfers across  
**flow gates** , which is in keeping with the physical characteristics of  
AC power networks. Note that again...

...these market intervals are markets for  
ephemeral, fungible commodities, AC power transfer effects across a **flow**  
**gate** during a time interval.

io Certain other further embodiments includes electrical power grids  
further containing...computer showing an ordering screen for hourly time

interval based market intervals for a specific **flow gate** market in accordance with certain embodiments.

Detailed Description of the Invention

Figure 3A depicts a...are not limited to acoustic

interfaces to humans, audio and visual identification portals to the

**contracting**

of AC **power transfer** regarding **flow gates**, encoding and decoding mechanisms used in long distance communication and interfaces to recording devices of agreed **contracts**.

A program code segment as used herein refers to instructions in a form executable or...an Energy product type 1 1 1 0. The location 1 1 12 is a **flow gate** of the **flow gate** collection of a first AC power network contained in the electrical power grid. Note that **flow gates** can represent a congestion constraint across more than one transmission line, and may not have...

...networks indicates each AC power network contained in the electrical power grid further contains a **flow gate** collection of **flow gates**. Each **flow gate** location being either from an associated first node of the AC power network to an...

...in the case of a collection of constrained transmission lines, will be denoted by a **flow gate** designator. An AC power transfer amount from node1 to node2 produces an amount of AC power transfer across the **flow gate** as essentially an associated linear, skewsymmetric function of the amount from node1 to node2 for each of the **flow gates** of the **flow gate** collection. For each of the **flow gates** of the **flow gate** collection, there is at least one market interval in the market interval collection of AC power transfer product type with the **flow gate** location.

In certain embodiments, each validated order of the validated order collection is with the...

...first node to the second node is further comprised of a validated order of the **flow gate** associated market interval. The amount ordered for that **flow gate** is essentially the associated linear, skew-symmetric function of the amount from the first node to the second node, for each of the **flow gates** of the **flow gate** collection.

Note that in certain further embodiments, there is a price associated with each validated order of the AC power transfers of the **flow gates**. In certain further embodiments, there is a price associated with the AC power transfer from...

...of an AC power network. Assume that AC power network has a collection of three **flow gates**.

is A validated order for an AC power transfer amount from node1 to node2 may contain validated orders for an associated amount for each **flow gate** of the

**flow gate** collection. Each of the **flow gate** validated orders may contain prices for their respective **flow gate**. The agreed amount would be calculated based upon the associated amounts and pricing of the **flow gates**. In certain 1 5 other embodiments, all validated orders have a price associated with them...by the first party to act on behalf of the first party with respect to **contracting** the AC **power transfer**.

Server system 3500 includes at least one server computer 3520 coupled to network 3200. Network...by the first party to act on behalf of the first party with respect to **contracting the AC power transfer** .

As shown in Figure 1 5, server system 3500 includes at least one server computer...computer showing an ordering screen for hourly time interval based market intervals for a specific **flow gate** market in accordance with certain embodiments.

The displayed information 4200 includes a variety of fields, including field 4202, where a specific **flow gate** or intertie may be selected. Immediately below that field is a field which specifies commodity...

...entries from 1 to 24, indicating the hourly AC power transfer markets 4204 in the **flow gate** location "COCOPP Unit 1" 4202. Consider the row labeled by the hour 4208 ending at...

...row displays the market state of the market interval with AC power transfer product type, **flow gate** io 4202 location and hour time interval ending at 1:00 for May 10, 1999...

#### Claim

... 2,  
wherein an AC power network contained in said electrical power grid further contains a **flow gate** collection of **flow gates** , each□flow□  
**gate** location  
being from an associated first node of said AC power network to an associated second node of said AC power network;  
wherein for each of said **flow gates** of said **flow gate** collection, there is at least one associated market interval in said market interval collection of AC power transfer product type with said **flow gate** location.

4 The method of Claim 1,  
wherein said electrical power grid further contains a...18,  
wherein an AC power network contained in said electrical power grid further contains a **flow gate** collection of **flow gates** , each□flow□  
**gate** location  
being from an associated first node of said AC power network to an associated second node of said AC power network;  
wherein for each of said **flow gates** of said **flow gate** collection, there is at least one associated market interval in said market interval collection of AC power transfer product type with said **flow gate** location.

20 The program operating system of Claim 17,  
wherein said electrical power grid further...34,  
wherein an AC power network contained in said electrical power grid further contains a **flow gate** collection of **flow gates** , each□flow□  
**gate** location  
being from an associated first node of said AC power network to an associated second node of said AC power network;  
wherein for each of said **flow gates** of said **flow gate** collection, there is at least one associated market interval in said market interval collection of AC power transfer product type with said **flow gate** location.

36 The computing system of Claim 33,  
wherein said electrical power grid further contains...





## [ Top Ten Myths About Electric Deregulation ]

by George C. Loehr

as appeared in the 15 April 98 issue of *Public Utilities Fortnightly*

We Americans seem to have a fascination with lists. There are lists of just about anything you can think of, from the Fortune 500 to baseball batting averages. There's even a book of lists. We especially like lists that rank by tens, like the ten best cities to live in or the ten worst school districts in America. Television has popularized top ten lists. One thinks immediately of David Letterman, of course, but back in the fifties there was a black and white TV show, "Your Hit Parade." It presented the top ten hit songs on that week's charts, performed by singers like Gisele MacKenzie and Snooky Lanson--inspiration for countless top 40, top 50, or top 100 contemporary radio disk-jockeys, and perhaps even Mr. Letterman.

And also the inspiration, at least in part, for this article. Increasingly, the tortured movement of the electric power industry toward competition and open access has reminded me of some bizarre TV show, a sort of electrical X Files. It has all the ingredients, from farce to federalism; a natural for a Top Ten list.

So here, with apologies to Gisele, Snooky, Dave et al, are my own "Top Ten Myths About Electric Power Deregulation."

### Myth #10

We Are Witnessing the Deregulation of Electric Power Supply in the U.S.

### Reality

We may be seeing some deregulation of the generation or supply side of the utility industry, but we are also experiencing massive new regulation of other aspects of electric power. In transmission and its use, regulation is intruding to a degree unprecedented in the 115 year history of electric supply in this country. Moreover, in reliability and its assurance, and in the very institutions of the industry, federal regulation has already taken over, or is being delayed only by debates over "how" (not over "whether"). Indeed, thousands and thousands of pages of new regulations now fill corporate libraries and congressional offices, providing lucrative employment opportunities for both attorneys and consultants, not to mention

### Myth #9

## Electricity is Just Another Commodity, Like Gas, Oil or Pork Bellies

### Reality

"Electricity is not a commodity; it's a phenomenon." This statement by an unidentified state commissioner was quoted by Bruce Radford in a Public Utilities Fortnightly editorial a few years ago. Neither he nor I know its source, but it's one of the best characterizations of electricity I've ever heard. It perfectly sums up the fundamental difference between electricity and other so-called commodities. Electricity is difficult, really impossible, to visualize. I can hold a pound of coal, or a sixteen ounce jar of oil or gas, in my hand. A few of us could hold a pork belly. But no one I know could hold a kilowatt-hour of electricity! That's because, no matter what the economists say, electricity is different—it's an abstraction. Or, as our wise but unknown commissioner said, it's a "phenomenon." (Who was that masked man, anyway? I don't know, but I wanted to thank him!)

Of course, I could say, "I AM electricity," since it's the electromagnetic force that holds the atoms of my body together (yours, too), and electricity makes my brain (such as it is) and nervous system work. As Walt Whitman said in *Leaves of Grass*, "I sing the body electric." And he wrote that long before Order 888!

### Myth #8

#### The Marketplace Will Take Care of Reliability

If you really believe this, I'd like to talk to you about some land in Florida my family has for sale.

### Reality

There are two kinds of bulk power system reliability: generation reliability (or adequacy), and transmission reliability (or security). Generation adequacy is virtually all anyone ever talks about when discussing reliability—yet it constitutes less than 10% of bulk power system reliability concerns. Transmission security, on the other hand, is responsible for over 90% of all reliability problems. Don't believe me? Think real fast of five or six (or ten or twelve) major blackouts. Then ask yourself which ones involved a generation adequacy problem, and which a transmission problem. Well? I'd be very surprised if even one involved generation.

Generation shortages, when they do occur, are almost always predictable and controllable; you can use voltage reductions, public appeals, or, as a last resort, rotating feeder outages. Transmission contingencies are almost always unpredictable and uncontrollable; they happen suddenly, often cascading over widespread areas in a matter of a few seconds. In the 1965 Northeast Blackout, the end was unalterably ordained in less than three seconds.

The marketplace can deal, at least to some extent, with the generation adequacy kind of reliability; principally in the types of products ESCOs and marketers will offer customers. While there may be significant problems in terms of public acceptability when folks start to get cut off, it is theoretically possible to let the market act. Not so when it comes to transmission reliability, though. There's no way to keep some customers on, no matter how much they're willing to pay, when the bulk power transmission system collapses. Think again of the 1965 Blackout; when the system went down, everybody went down—even the wealthy folks in their million dollar condos on Central Park West.

### Myth #7

## The Bulk Power Transmission System is a Highly Underutilized Resource

### Reality

Probably more so than any other major industry in the modern world, electric power is defined and controlled by the Laws of Physics. Ignore or violate them, and you do so at your own risk. Transmission lines will not neatly load up proportional to their thermal capabilities. Nor can you "send" the electricity down this line or that, as you wish. Power flows over a transmission grid according to the electrical characteristics of the various elements, according to Kirchhoff's Laws. Further, the system must always be operated in accordance with defined criteria, so that, as a minimum, no single contingency will cause cascading outages and a blackout. Actual transfer capabilities must be computed and continuously updated as the system goes through its second-by-second changes. In actual experience, many critical transmission interfaces are loaded at or close to their maximum transfer capabilities a high percentage of the time.

### Myth #6

"Pancaking" and "Location Based Pricing" are All that Prevent Power Transfers from Beaumont, Texas to Bangor, Maine

### Reality

The further you try to go in an interconnection, the more transmission interfaces you'll cross. Thus the more likely it will be that you'll encounter at least one interface that doesn't have available capacity. "The chain is only as strong as its weakest link." Then there's the matter of transmission losses--both watts and VARs. Losses are equal to the current squared times the resistance (the inductive reactance in the case of VARs). The further you go, the more electrical resistance you have to pass through--and the more power will be lost. Beaumont to Bangor may look attractive on paper, but when you add up the losses, and add them to the price, the savings may disappear.

### Myth #5

VARs are Something We Don't Have to Worry About -- After All, They're Imaginary!

### Reality

VARs don't travel well; they're lost at a rate about ten times higher than watts. And, although they're "imaginary" in the mathematical sense, they are absolutely essential to the transmission of power. VARs hold the voltage up sort of like the poles hold the wires up. Furthermore, since VAR losses are proportional to the square of the current, they increase exponentially as power flow increases. VARs are sort of like the water in a steam locomotive; it doesn't provide any of the energy to pull the train (the coal or oil does that), but the train will not get anywhere without water to convert to steam. Or, VARs are like the carrier wave in certain radio communications; the information is in the signal impressed on it, but the carrier is essential.

### Myth #4

The Transmission Owners have been Controlling Reliability Criteria to Eliminate Competition

## **Reality**

There may be a few examples of a vertically integrated utility trying to do this right now, but both the past and the future argue against its being a significant problem. The reliability infrastructure in place today had its genesis in crisis. The Northeast Blackout of 1965 both traumatized executives in large portions of the industry, and impelled them into making reliability a first priority. The fairly stringent planning and operating criteria which followed have survived the test of time and have served the customers well. Executives were committed to the principles of reliability, and to the coordination and cooperation necessary to assure it, and the engineers and other technical experts became its guardians. But most important, perhaps, is the fact that this is nothing new--it's been the case since the 1960s, long before competition and open access were issues.

In the future, when traditional utilities have divested themselves of their generating assets (as, I'm sure, they all will, either voluntarily or by other means), it will be the transmission owners who will be most sorely tempted to lower reliability standards. Since their major source of income will be transmission usage fees, there will be a real financial incentive to make criteria less stringent--even at the risk of blackouts.

## **Myth #3**

Today's Reliability Criteria are Too Stringent and Too Restrictive; Can't you Relax them Just a Little?

## **Reality**

Today's transmission criteria are based on the simple concept of being able to survive, without blackouts or loss of customer load, the "worst single contingency." This is true universally across North America and throughout most of the developed world. You can't just make the system "a little less reliable." You either design it to survive the worst single contingency, or you don't; there's no in between. It's a quantum kind of thing. Some have suggested that transmission criteria should be based on probability rather than the present deterministic principles. Actually, industry experts have been working on this for over 30 years, but so far with only limited success in developing a practical system. The problem is that the probability of any single event approaches zero, while the number of possible events approaches infinity.

The larger problem with relaxing reliability standards is a human inclination best described in Nobel Prize winning physicist Richard Feynman's book, *What Do You Care What Other People Think*. Mr. Feynman served on the President's special commission investigating the tragic accident of the space shuttle "Challenger." He describes in his book how he asked numerous NASA officials why they had lowered the shuttle's design standards. He was shocked when he repeatedly received the answer, "We hadn't had any accidents, so we figured we could lower the standards." As Feynman points out, the reason they had not had any accidents was precisely because they had high standards! Lower the criteria, and you're entering terra incognita.

## **Myth #2**

"If You're Focusing on Reliability, You Haven't Gotten the Message"

## **Reality**

That's an actual quote. So are these: "If your company is focusing on reliability, I'd downgrade your

bonds right now"; "Competition should be your top priority." It's difficult to comprehend, except for hubris, how anyone could make such a statement in this day and age. As a society, we are totally and irreversibly dependent on a reliable supply of electricity. Next to food and shelter, it's probably the most essential of our everyday needs. We live in the Age of Information; its almost instantaneous acquisition and availability lie at the core of our economy. Without a reliable supply of electricity, almost nothing can happen! Yet intelligent people actually act like it isn't important. Would we tell American Airlines, "If you're focusing on safety, you haven't gotten the message"?! Yet reliability is to electric power supply as safety is to air travel.

Reliability should be everyone's top priority. It's in everyone's best interest, whether generator, marketer, transmission owner, customer, or whatever.

And, the #1 Myth about electric power deregulation:

### **Myth #1**

Reliability in the Restructured, Deregulated Industry Will be Just as High as in the Past

### **Reality**

Don't bet on it! In fact, it's far more likely that deregulation and restructuring will lead to major degradation in bulk power system reliability. There are many reasons for this, some of which have already been touched on above. But here are a few of the most important:

**Complication** -- Assuring reliability used to be fairly straightforward--not easy, but straightforward. There were a limited number of players, a relatively simple infrastructure, and virtually universal commitment to the goals of reliability and conformance with criteria. Perhaps most important, there was a culture best characterized by cooperation and coordination. In the "new world order," we now have an almost limitless number of participants, a very complex (and becoming even more so) infrastructure, little commitment to the goals of reliability, a "how can we beat it" attitude toward criteria by many--and a culture characterized at best by competition and confidentiality, and at worst by distrust, litigation and authoritarianism.

**Legalism** -- Conformance with criteria is becoming an exercise in what we can get away with; how far can we go to just avoid violating the rules; and a search for loopholes. Conformance is "mandatory", and punishment assured. What a far cry from the days of so-called "voluntary" conformance, when players obeyed the rules because it was the right thing to do (how quaint!), and because they understood that reliability was in the best interest of all, and you couldn't expect others to respect the rules if you didn't follow them yourself. That's a way of functioning which the bureaucratic mind simply cannot conceive of, and yet it's the way most of North America functioned for more than a generation. And functioned very well, thank you, as the record clearly demonstrates.

**Politicization** -- Now that the reliability infrastructure has made conformance with reliability standards "mandatory," which apparently it cannot legally do without governmental authorization, reliability's Pandora's box has been opened to politicians and bureaucrats. But, of course, this is the inevitable outcome of the regulatory takeover of the industry's own organizations. A federal "backstop," we are told, must be provided, government must review and sanction all standards, and reliability is OK as long as it doesn't get in the way of the market. The judgment of professional experts will be replaced by political expediency.

**Expediency** -- Many of the industry's own organizations which were established for the purpose of promoting reliability have in essence sold their birthright. They have judged that the pragmatic course is to follow the politically correct approach, "if you can't beat Ôem, join Ôem." Some did this because they genuinely believed they had no alternative, and this was a less-than-perfect way to maintain at least some leverage vis-a-vis reliability. Some did it to survive. Some saw opportunities to build new empires. A few became "true believers." And some simply lacked the courage. All have been, in my view, misguided.

The bottom line is this: we will see more blackouts. It may take just a few months, or it may take years (we are dealing with the subtleties of probability), but it will happen, make no mistake about it. If this is so, one might ask, how come so few people have said it?! Ah, there's the rub! Well, for one thing, engineers love order--and most of the people who would agree with me are also engineers. We don't like to rock the boat. We'd rather work from within, and we have a devotion to authority which is sometimes far too strong. Many believe that, given the present situation, the only way to help reliability is to work from within and try to make the best of a bad situation. And, some of us would like to keep our jobs! There's been a kind of blanket of silence thrown over the whole industry. It's not written down anywhere, but everyone knows that speaking out, even in private meetings, may, to paraphrase the Surgeon General, be dangerous to your career. Everyone knows, too, that decisions will be made at the top, and contrary opinions are not welcome; one organization actually bragged about turning itself into a "top down" organization.

What happens next? Well, it's far too late to stop this train, no matter what happens in the near term. We'll all have to sit tight and hope for the best. And do what we each can--because, in the final analysis, that's all we can do.

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